

**WHAT IS CLAIMED IS:**

1           1.    A method of flat-field calibrating an image  
2           comprising:

3                obtaining a plurality of images  
4                performing linear regression on the plurality of images  
5           to obtain a gain and an offset; and  
6                determining the desired image using the gain and the  
7           offset.

1           2.    The method of Claim 1, further comprising obtaining  
2           a plurality of images ranging from dark current to full-well.

1           3.    The method of Claim 1, further comprising performing  
2           linear regression on each pixel of the plurality of images.

1           4.    The method of Claim 1, further comprising  
2           calculating the desired image using the equation:

3           Desired\_image = (Measured\_image - offset\_map) / gain\_map.

1           5.    The method of Claim 1, further comprising moving a  
2           calibration slide while obtaining the plurality of images.

1           6.    A method of reducing offset map noise comprising:  
2           obtaining a plurality of images

3 obtaining the average dark current of the plurality of  
4 images; and

5 determining the desired image using the gain and the  
6 average dark current.

1 7. The method of Claim 6, further comprising obtaining  
2 a plurality of images ranging from dark current to full-well.

1 8. The method of Claim 6, further comprising  
2 calculating the desired image using the equation:

3 
$$\text{Desired\_image} = (\text{Measured\_image} - \text{average dark current}) /$$
  
4 
$$\text{gain\_map}.$$

1 9. The method of Claim 6, further comprising averaging  
2 multiple frames to determine the desired image.

1 10. A method of reducing filed curvature in an image  
2 comprising:

3 obtaining an average curvature map of a plurality of  
4 image panels;

5 dividing each panel by the curvature map.

1 11. The method of Claim 10, further comprising  
2 normalizing the curvature map by the average intensity of the  
3 curvature map.

1           12. The method of Claim 10, further comprising smoothing  
2 the curvature map.

1           13. The method of Claim 10, further comprising using  
2 only pixels above a background intensity to obtain the average  
3 curvature map.

1           14. The method of Claim 10, further comprising reducing  
2 noise in the image by curve-fitting the image pixels.

1           15. A method of reducing discontinuities between  
2 adjacent panels in an image comprising:

3                 comparing a border of each panel on all sides to generate  
4 border intensity scaling values; and

5                 scaling a boundary of each panel to a point approximately  
6 midway between a current panel and an adjacent panel.

1           16. The method of Claim 15, further comprising scaling  
2 the boundary of each panel using an inverse square weighting.

1           17. The method of Claim 15, further comprising scaling  
2 the boundary of each panel using an inverse weighting.